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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,966	03/31/2005	James Guillet	1047-025	6278
34060	7590	04/30/2010		
MICHAEL N. HAYNES 1341 HUNTERSFIELD CLOSE KESWICK, VA 22947			EXAMINER LIGHTFOOT, ELENA TSOY	
			ART UNIT 1715	PAPER NUMBER
			MAIL DATE 04/30/2010	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/529,966

Applicant(s)

GUILLET ET AL.

Examiner

ELENA Tsoy LIGHTFOOT

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 15-17, 67-71, 74-76 and 82-88 is/are pending in the application.
- 4a) Of the above claim(s) 1, 15-17, 67, 68, 70 and 83-88 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 69, 71, 74-76 and 82 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/4/10
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Response to Amendment

Amendment filed on March 4, 2010 has been entered. Claim 72 has been cancelled. Claims 1, 15-17, 67-71, 74-76 and 82-88 are pending in the application. Claims 1, 15-17, 67-68, 70, 83-88 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention and species.

Claims examined on the merits are 69, 71, 74-76, and 82.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Rejection of claims 69, 71, 72, 74-76, and 82 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement has been withdrawn due to amendment.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Rejection of claims 69, 71-72, 74-76, and 82 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention has been withdrawn due to amendment.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Rejection of claims 69, 71-72, 74-76, and 82 under 35 U.S.C. 103(a) as being unpatentable over Yoshioka et al (US 5,225,062) has been withdrawn because the Examiner agrees with Applicants arguments.
7. Rejection of claims 69, 71-72, 74-76, and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blum (US 6,180,562) in view of Tanaka et al (US 4732930) has been withdrawn because the Examiner agrees with Applicants arguments.
8. Claims 69, 71, 74-76, and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blum (US 6,180,562) in view of Savignano et al (US 5,653,054), and further in view of Tanaka et al '930.

Blum discloses that plants may be protected from damage caused by frost and/or freeze (See column 1, lines 10-12) by releasing heat during freezing transition (See column 4, lines 21-25) by applying an aqueous composition comprising a crosslinked polymer (claimed internally substantially crosslinked polymer) (See column 10, lines 54-56) or a polymer having a relatively low amount of crosslinking (i.e. being internally crosslinked) (See column 10, lines 37-42) to the surfaces of the plants (See column 1, lines 6-10).

As to solid particles of 1-1000 nm having claimed temperature range of releasing heat, Blum discloses in the BACKGROUND OF THE INVENTION that it was well known in the art to combine water with other components to form freeze preventative and/or protective compositions for direct application to plant surfaces. Such compositions for

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direct application to plants have mainly involved the use of *freezing point depressants*, such as monohydric alcohols, small chain dihydroxy and polyhydroxy alcohols, such as propylene glycol, polyalkyl glycols, and so forth, and other agents such as ***cross-linked polyacrylic acid*** (See column 2, lines 8-15). For example, U.S. Pat. No. 5,653,054 to Savignano et al. discloses a composition for preventing or retarding frost formation on grass or leafy plants comprising a mixture of water, a water-soluble freezing point depressant such as propylene glycol, and a water dispersible thickening agent such as a cross-linked polyacrylic acid polymer (See column 2, lines 15-25). Savignano et al '054 teaches that a suitable water dispersible thickening agent includes a **copolymer of acrylamide with acrylic acid ester** (claimed hydrophobic substituent), or preferably a **crosslinked polyacrylic acid** polymer (See column 3, lines 26-31) having a molecular weight in the range of about **750,000 to about 4,000,000** (See column 3, lines 15-18) prepared by polymerizing a mixture of acrylic acid (claimed hydrophilic water soluble monomer) and up to about 35 wt % of a copolymerizable monomer, e.g., an alkyl acrylate or methacrylate (claimed hydrophobic substituent), in the presence of a *crosslinking agent* having two or more $\text{CH}_2=\text{C}<$ groups per molecule, e.g., *divinyl benzene* or butadiene (i.e. crosslinked *internally*) (See column 3, lines 18-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a copolymer of *acrylamide* with acrylic acid ester in preventative and/or protective compositions of prior art for direct application to plant surfaces instead of a cross-linked polyacrylic acid polymer in addition to freezing point depressant such as propylene glycol with the expectation of providing the desired

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preventing or retarding frost formation on grass or leafy plants since Savignano et al teaches that either a copolymer of acrylamide with acrylic acid ester or crosslinked polyacrylic acid polymer together with freezing point depressant such as propylene glycol is suitable for the use in plant protecting compositions.

It is the Examiner's position that the crosslinked polymer of Savignano et al having M.W. of 750,000 to about 4,000,000 is *internally* crosslinked polymer comprising at least one hydrophobic substituent and at least one hydrophilic substituent in the form of solid particles having diameter in the range of 1-1000 nm, as required by claims 74, 76, 82.

As to a crosslinked polymer comprising NIPAM, Tanaka et al teaches that hydrogel polymers with *desired* strength, *swelling* degree, *degree of crosslinking*, **phase transition temperature** and the like may be made by crosslinking a main isopropylacrylamide (NIPAM) monomer using a crosslinking agents such as ethylene glycol dimethacrylate, glycerine triacrylate or *divinylbenzene* (claimed hydrophobic substituent) (See column 2, lines 52-66).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made a hydrogel polymer in Blum in view of Savignano et al by crosslinking NIPAM using a crosslinking agent such as ethylene glycol dimethacrylate, glycerine triacrylate or divinylbenzene with the expectation of providing the desired strength, swelling degree, degree of crosslinking, **phase transition temperature**, as taught by Tanaka et al, since Savignano et al does not limit its teaching to particular acrylamides.

Response to Arguments

9. Applicant's arguments with respect to claims 69, 71, 74-76, and 82 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELENA Tsoy LIGHTFOOT whose telephone number is (571)272-1429. The examiner can normally be reached on Monday-Friday, 9:00AM - 5:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elena Tsoy Lightfoot, Ph.D.
Primary Examiner
Art Unit 1715

April 30, 2010

/Elena Tsoy Lightfoot/